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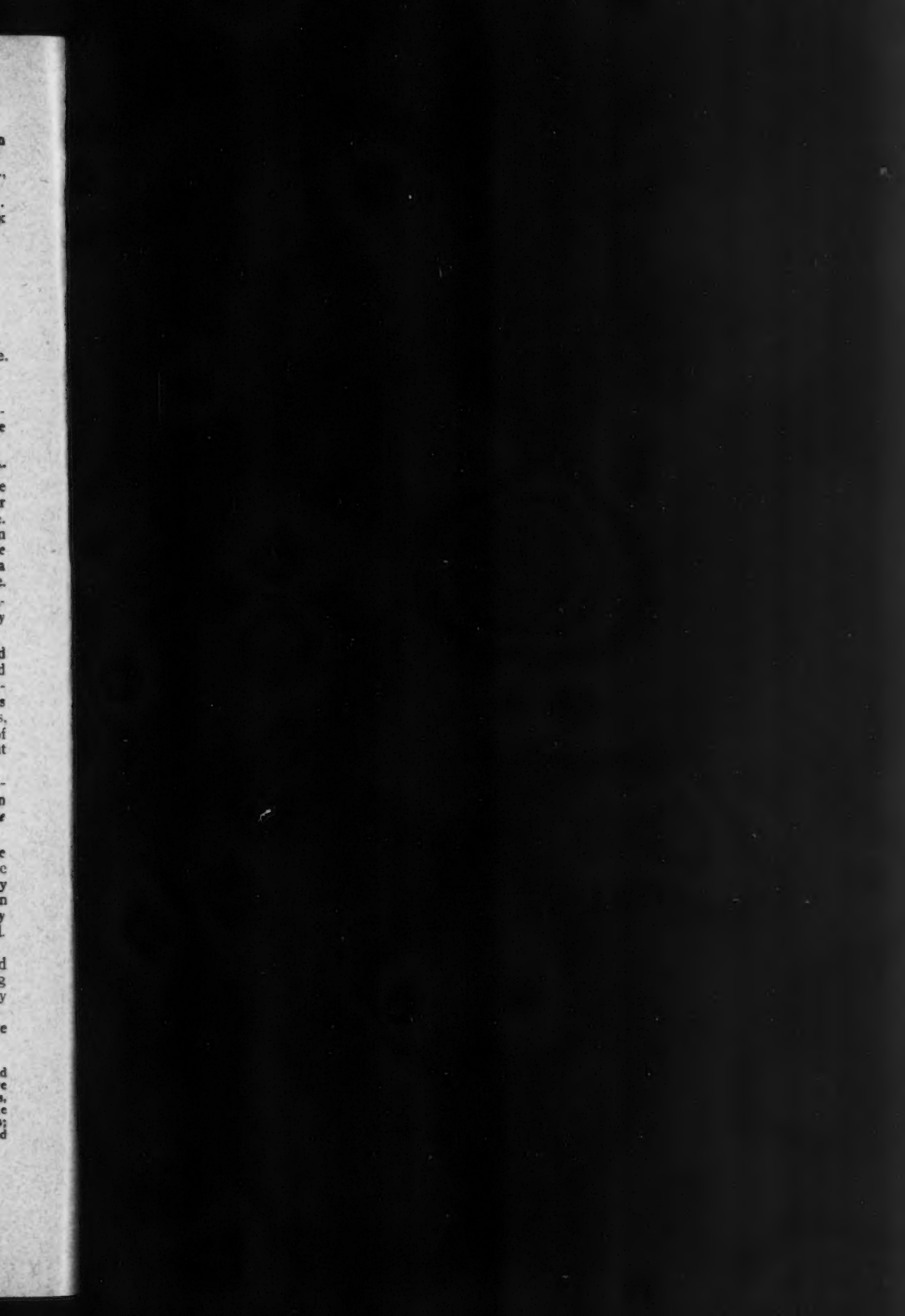


ENTOMOLOGICAL NEWS

VOL. XLVI. MARCH, 1935 No. 3

The Prothoracic Pleurites of Coleoptera.

By G. F. FERRIS, Stanford University, California.

A search of both morphological and purely systematic literature indicates that neither morphologists nor systematists have developed any precise understanding of the homologies of the prothoracic pleurites of the Coleoptera. The systematic workers make use of traditional descriptive phrases which have no clear morphological meaning or are even morphologically untrue. The morphologists disagree sharply among themselves as to the interpretation of the various parts. It is evident that a new approach to the problem is desirable.

As the guide for such an approach there is here adopted the concept of the origin and nature of the thoracic pleurites which has been so clearly elucidated by Snodgrass.[1] This concept regards these parts as vestiges of a primitive sub-coxal segment of the leg, which has become incorporated in the body wall with a consequent reduction and modification of its parts. These parts—however great the degree of modification and reduction—must bear some relation to a definite, common plan of organization that is dependent upon this morphological origin. If morphological reasoning has any validity it may be assumed that some feature or features will persist, throughout all the changes that have taken place, to such a degree as to afford a basis for homologizing the conditions found in widely differing forms, especially if these features be sought for in a series of types leading from one extreme to another. Such is the basis for all morphological reasoning, but this fundamental doctrine appears not to have been consistently applied in connection with the structures here under consideration.

It will be well to review the persistent characters or landmarks that may be available in the present study, such availability being determined by the experience of other morphol-

[1] Snodgrass, R. E. Morphology and mechanism of the insect thorax. Smithsonian Miscellaneous Collections, 80 (1). 1-108; figs. (1927).

ogists and from conclusions derived in the course of the study itself.

In whatever manner the primitive sub-coxal segment of the legs may have been articulated to the body, it is clear that its articulation to the next succeeding segment was by a joint moving upon two condyles, for these condyles generally remain, although probably not in their primitive positions. It may be assumed that the articulation with the body was of such a nature as to permit of a maximum of rotatory movement, but with the incorporation of the sub-coxa into the body wall this freedom would have been lost if not maintained by compensatory changes in the next articulation. These changes have been accomplished in various ways. One condyle may be completely suppressed, and this appears in some cases to have happened, although this is not the most favored solution. The two condyles may remain as points upon a single sclerite which is reduced in size and surrounded by membranous areas such as to allow of considerable flexibility. Or the condyles may be placed upon separate pieces, one of which is reduced in size leaving the other as the major point of suspension and producing what is in effect a mono-condylar joint. Or the sub-coxa as a whole may be greatly reduced in size and the coxa retracted into a pit the walls of which function as a socket the result being virtually a ball-and-socket joint.

The separation of the two condyles upon distinct pieces is a common phenomenon. The smaller piece thus produced, bearing what is generally the minor condyle, is the trochantin. The larger piece forms the area to which the term "pleurum" is generally applied. This area is frequently composed of two minor areas, separated by a more or less distinct furrow into an anterior piece, the "episternum," and a posterior piece, the "epimeron." This furrow is hardly a suture, in the sense that it is the meeting of two areas of sclerotization, it is more in the nature of a stiffening fold the internal aspect of which is a ridge that functions as a support for the major coxal condyle which is set at its apex. At some point along its length there is commonly a more or less tubular invagination which may extend far into the body. This is the pleural process, or, as it occurs in the prothorax, the "prothoracic pleural apophysis."

Of the various elements making up this primitive sub-coxal segment, four—the two condyles, the pleural fold and the apophysis—are of such a persistent nature that they may serve as the landmarks for morphological orientation in an investigation of the prothoracic structures. Any one—or occasionally even all—of them may be suppressed or so altered as to be unrecognizable but the evidence which they present in a series of forms is so clear that in the Coleoptera a consistent and logical interpretation of the pleural structures is possible with their aid.

It is desirable, as a first step in this study, to find some form in which the situation is uncomplicated by secondary developments, or if none such appears to find one that comes reasonably close to such a condition. It is a matter of dispute as to which of the groups of the Coleoptera is the most generalized. There has been a common tendency to regard some of the Adephaga as being so, but Crampton [2] has maintained that this distinction belongs to the Cantharoidea. For our purposes the question is somewhat beside the point. We need merely to find a form in which the situation in regard to the particular features in which we are interested is clear. It so happens, however, that the most suitable forms observed do occur in the Cantharoidea and we may begin with a representative of this group, although there are others—Staphylinids for example—which would do almost equally well.

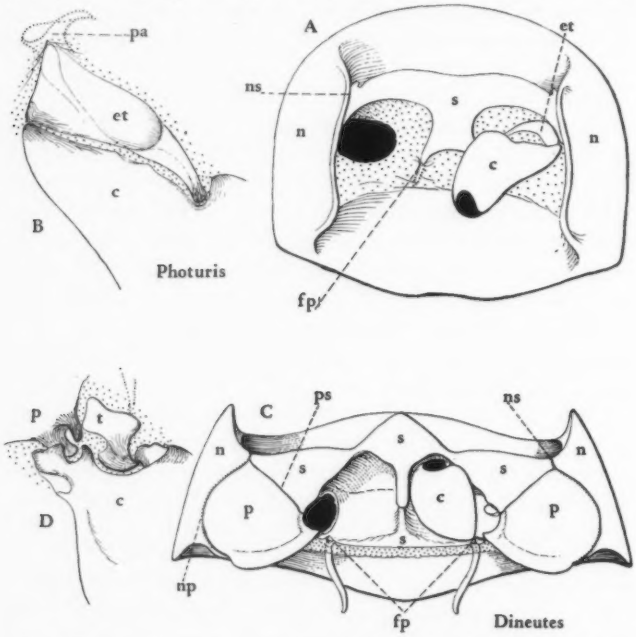
The Prothoracic Pleurites of a Lampyrid.

Determined specimens of *Photuris pennsylvanica* (DeGeer) being available, this species has been employed. Crampton has used a species of *Lampyris* which seems to agree closely.

In the ventral aspect of the prothorax (Fig. I, A) the following structures may be noted: on each side a broad zone (*n*) apparently formed by the inflexed margins of the notum; a central, broadly T-shaped plate (*s*), the lateral arms of which meet the lateral zones along a short suture (*ns*), this plate being the sternum as is evidenced by those most stable of landmarks, the furcal pits (*fp*); the large coxae (*c*), set in a quite

[2] Crampton, G. C. A comparison of the neck and prothoracic sclerites through the orders of insects from the standpoint of phylogeny. Transactions American Entomological Sciety 52: 199-248; pls. x-xvii. (1926).

extensive membranous area and showing clearly at the base a somewhat crescent-shaped piece (*et*). Dissecting off a coxa and accompanying the dissection with a manipulation of the parts, we find that this basal piece (Fig. I, B) articulates with the coxa at two points. There is no condylar articulation with the lateral thoracic margin which slightly overlaps this basal piece, there being merely a very narrow membranous connec-



Text Fig. I—*Photuris pennsylvanica* (DeGeer). A, ventral aspect of prothorax, one coxa removed; B, base of coxa. *Dineutes discolor* Aube. C, ventral aspect of prothorax, one coxa removed; D, base of coxa.

tion between the two parts. Upon this basal piece there is a fold or pit, leading into a short invaginated apophysis (*pa*).

The interpretation of these structures, in the light of our earlier discussion of landmarks, seems clear. There seems no escape from the conclusion that the basal piece, which bears three of the four pleural landmarks—two condyles and an

apophysis—is the pleurum. The pleural "suture" and pleural ridge alone are lacking to make the picture complete. The pleurum, therefore, in this case includes the trochantin, the resulting piece being what Crampton (ref. cited) has called the "eutrochantin." The lateral zones, which appear as part of the notum, are, indeed, merely the inflexed margins of this part. The situation seems perfectly clear.

This is the interpretation arrived at by Crampton, although on somewhat different grounds. It is in sharp contrast to the view commonly held and more or less clearly expressed in various texts—but which seems to have been arrived at by no definite chain of morphological reasoning—that the lateral zones are composed of the fused notum and pleurum and that the basal coxal piece is merely the trochantin.

The Prothoracic Pleurites of a Gyrinid.

The greater part of all published statements concerning the prothoracic structures of Coleoptera has been based upon representatives of the Carabidae or at least of Adephaga. Species of *Harpalus* have been especially favored by American authors (Comstock, MacGillivray). Specimens of all the families of Adephaga represented in North America have been examined in this study and out of them a Gyrinid, *Dineutes discolor* Aubé, has been selected as being the least complicated by secondary developments, the coxae not being so deeply retracted into their acetabula as in the Carabids and Cicindelids.

Here, examining the ventral aspect of the prothorax, we find a situation very different from that in *Photuris*. There is on each side a narrow lateral zone (Fig. I, C *n*) which is evidently the inflexed edge of the notum; there is a large median area, in which the acetabula of the coxae are impressed and which is accepted by all as the sternum, its landmarks, the furcae (*fp*) being widely separated. Forming a broad wedge between the sternum and the lateral notal zone is a large piece (*p*) which is accepted by all authors except Crampton as the pleurum. It is divided—in this form rather indistinctly—into two pieces, one of which forms a narrow caudal border and has been interpreted as the epimeron, the larger being the episternum.

Dissecting a coxa from its acetabulum and by manipulation observing its connections we find imbedded in the membrane between it and the body a small piece (Fig. I D *t*), which articulates with the coxa by a single condyle, but has no articulation with the body although it is provided with muscles. This little piece is generally accepted as the trochantin. The coxa itself is articulated to the body by a very distinct condyle which lies on the so-called pleurum just at the point where the pleurosternal suture (*ps*) meets the acetabulum. This condyle is very distinct and constitutes the major articulation of the leg with the body.

No pleural apophysis can be found. The impressed line which is supposed to be the "pleural suture" separating episternum and epimeron is possibly not homologous with the pleural fold of other forms, it being in the writer's opinion merely a surface indication of the underlying line along which the intersegmental membrane joins the prothorax.

We are thus reduced to two of the four possible landmarks, but these are absolutely clear. Accepting their indications as valid, we must consider the small piece at the base of the coxa to be the trochantin and the large piece commonly regarded as the pleurum to be so in fact. Crampton (ref. cited) has adopted the view that this larger piece is a part of the notum, secondarily cut off. There seems no reason to accept any such conclusion. To do so requires a series of entirely gratuitous assumptions. It must be assumed that the major condyle has either moved over to the notum, with a consequent suppression of the pleurum except for the trochantin, or that the pleurum has fused with the notum. It must then be assumed that this portion of the notum has been cut off by the suture np. It should be noted that this suture is not a mere line. In specimens that have been properly softened by boiling in caustic potash it can be demonstrated as actually the surface indication of a quite broad membranous area. We may conclude that in this case the commonly accepted interpretation is correct, with the possible exception of the application of the terms episternum and epimeron.

(To be continued)

Acridian Researches within Northeastern Texas (Orthoptera).

By F. B. Isely, Trinity University, Waxahachie, Texas.

(Continued from page 43)

Dichromorphia viridis (Sc.). Locally common in woods and along streams in moist situations; VIII-X; Ellis, Anderson, Smith, Tarrant and Van Zandt Counties.

Geneotettix deorum (Sc.). Occasional to frequent upland prairie species; VI-X; Ellis, Dallas, Hill, Johnson, Palo Pinto, Parker, Tarrant and Van Zandt Counties.

Psoloessa texana texana (Sc.). A frequent March to April species in sand oak woods; peak collection "Tarrant county, east cross timber open woods, III, 31, '33, 7 ♂, 11 ♀, 3 juv., four collectors"; III-VIII; Denton, Harrison, Hill, Johnson, Marion, Palo Pinto and Tarrant Counties.

Boopedon nubilum (Say). Only taken at one station in the west cross timbers, VII, 31-VIII, 2, '34, 6 ♂, 3 ♀, in a level pasture covered with a heavy growth of fine mesquite grass and an open growth of mesquite trees, Worth Ranch, Palo Pinto County.

B. maculatum Caudell. Common to abundant in upland weedy pastures and virgin prairie tracts; VI-VIII, Ellis, Dallas, Johnson, Palo Pinto, Navarro and Tarrant Counties.

B. auriventris McNeill.[6] Checked as rare until VI, 19, '34, McWhorter's Ranch, May Pearl, Ellis, 12 ♂, 22 ♀, 6 juv.; only ten other individuals taken; VI-VII; Ellis and Tarrant Counties.

Aulocara elliotti (Thos.). Only a few specimens of this "great plains" acridine taken and most of these at the west cross timber and grand prairie stations; VI-IX; Ellis, Palo Pinto and Tarrant Counties.

Oedipodinae.

Arphia conspersa Sc. This wide ranging western species has been taken at two upland limestone prairie stations. Thirteen juveniles taken in December, January and March, were all in the fifth instar. It reaches maturity late in March, to early April; my latest record is May 15; Dallas and Tarrant Counties. At Gothic, Gunnison County, Colorado, I took *A. conspersa* during July at 9,000-10,000 feet elevation.

A. xanthoptera (Brum.). A late summer species in northeastern Texas. So far only an occasional *Arphia* in sandy soil open woods; VII-XI; Anderson, Dallas, Denton (Dr. Harris), Johnson and Van Zandt Counties.

A. SIMPLEX Sc. An abundant and striking species in its climax habitat. The outstanding oedipodid of this area. Peak of abundance in late May and June, adults taken from April to December. Taken from every general type of soil: Chalk, Houston stony clay, Ellis clay, Houston black clay, cross timber sandy loams, alluvial soils and others. Shows a strong preference for timber margins but occasionally taken on open prairie. Unlike any other oedipodid that I have studied, it is most abundantly found in this area in a dense mat of vegetation, frequently a heavy tangle of curly mesquite grass, IV-XII; generally distributed throughout this area.

CHORTOPHAGA VIRIDIFASCIATA (DeGeer). Apparently a year-around breeder, juveniles taken January to December, peak of adult abundance, III-IV. Ubiquitous in its habitat throughout northeastern Texas.

ENCOPTOLOPHUS SUBGRACILIS Caudell. An occasional to frequent black land, cotton field species, VI-XI; Ellis County.

E. SORDIDUS COSTALIS (Sc.).[7] Like *C. viridifasciatus*, juveniles and adults are found the year-around. However, the adult peak for this species is X-XII; Ellis, Bosque, Dallas, Hill, Johnson, Palo Pinto, Parker and Tarrant Counties.

HIPPISCUS RUGOSUS (Sc.). An occasional to common late summer and fall species; Ellis, Dallas, Denton, Freestone, Johnson, Palo Pinto, Parker, Smith, Tarrant and Van Zandt Counties.

PARDALOPHORA PHOENICOPTERA (Burm.). An occasional open post oak, sandy soil, species; V-VI; Dallas, Denton, Johnson, Marion, Tarrant and Wise Counties.

P. SAUSSUREI (Sc.). This *Pardalophora* also shows a preference for sandy soils, but it is much more abundant and more widely distributed than *P. phoenicoptera* in this area. Peak of adult abundance late May and June, taken as late as September; Ellis, Dallas, Denton, Harrison, Johnson, Kaufman, Palo Pinto, Van Zandt and Wise Counties.

XANTHIPPUS CORALLIPES PANTHERINUS (Sc.). A common, wary, alert, strong-flying, upland limestone prairie species during May and June, infrequent in July and August; IV-VIII; Ellis, Dallas, Denton, Hill, Parker, Tarrant and Wise Counties.

DISSOSTEIRA CAROLINA (L.). This well-known American grasshopper has only been taken occasionally; V-X; Ellis, Anderson, Dallas, Hill, Tarrant and Van Zandt Counties.

SPHARAGEMON BOLLI sc. An occasional species of sandy oak woods; VI-IX; Anderson, Dallas, Freestone, Johnson, Kaufman, Palo Pinto, Tarrant and Van Zandt Counties.

S. COLLARE CRISTATUM (Sc.). Common to abundant in sandy fields; VI-X; Ellis, Dallas, Denton, Johnson, Palo Pinto, Parker, Tarrant, Van Zandt and Wise Counties.

S. EQUALE (Say). Common in favorable habitats; VI-XI; Ellis, Bosque, Denton (Dr. Harris), Johnson, Palo Pinto, Parker, Tarrant, Van Zandt and Wise Counties.

PLATYLACTISTA AZTECUS (Sauss.). Fifty individuals of this elusive, low-flying, ground-hugging oedopodid have been checked in my field notes; most of these were taken IX-XII; Ellis, Dallas, Bosque, Somervell, Palo Pinto and Parker Counties (Camp Wisdom).

TRACHYRHACHIS KIOWA FUSCIFRONS (Stal.). Two hundred eight specimens of this small, active hopper have been checked; sometimes swarming along golf fairways, adults taken IV-XII; Ellis, Bosque, Dallas, Denton, Hill, Johnson, Palo Pinto, Parker, Somervell, Tarrant, Van Zandt and Wise Counties.

"MESTOBREGMA" CAPITO (Stal.). This species has not been taken in the blackland prairie belt but at four bare, stony, localities in the grand prairie and west cross timber belts; VI-VIII; Johnson, Palo Pinto, Parker and Tarrant Counties.

PSINIDIA FENESTRALIS FENESTRALIS Stal. One of my students, Miss Jean Wilson, has found this sandy soil species frequent at Ben Wheeler, Van Zandt County; VI-IX.

TRIMEROTROPIS CITRINA Sc. Common on sandy flats along streams and on gravel roadways; VI-XII; Ellis, Bosque, Dallas, Denton, Palo Pinto, Smith, Tarrant, Van Zandt and Wise Counties.

T. PISTRINARIA Sauss. Common on "white rock" ridges and hill-sides; also taken on red-beds; VII-XII; Ellis, Dallas, Johnson, Somervell and Tarrant Counties.

T. SAXATILIS McNeill. Worth Ranch, Palo Pinto County, VIII, 1, '34, 3 ♂, 1 ♀; Western Parker County, highway No. 1; VIII, 2, '34, 5 ♂, 4 ♀.

HADROTETTIX TRIFASCIATUS (Say). This spectacular species is found on both calcareous and sandy loam soils, but in our records shows a preference for the former. The climax of adult activity is late June through July, only occasional individuals taken in September and October; taken at all black land and grand prairie stations, and at east and west cross timber stations.

BATRACHOTETRIGINAE.

BRACHYSTOLA MAGNA (Girard). Only three records for this "giant hopper," Wise County, VI, 3, '32, 2 juvs.; southwestern Johnson County, VII, 4, '33, 6 ♂, 1 ♀; western Tarrant County, VIII, 2, '34, 1 ♀.

CYRTACANTHACRINAE.

ROMALEA MICROPTERA (Beauvois). My records of this east Texas timber "giant" are based on specimens sent by students: Van Zandt County; VIII, '32, 1 ♀ (Jean Wilson); Anderson County, VII, '33, 2 juvs. (Ruth Dillon), Smith County, VII, '34, 1 ♀ (Charles Ferguson).

LEPTYSMA MARGINICOLLIS Serv. An infrequent species save for one locality, marshy pasture on highway 85, four miles west of Marshall, Harrison County, IV, 2, '34, 16 ♂, 7 ♀, also taken in Henderson and Tarrant Counties.

SCHISTOCERCA DAMNIFICA DAMNIFICA (Sauss.). An interesting timber-loving species, active on warm days; XI-IV; Ellis, Harrison, Marion, Tarrant and Van Zandt Counties.

SCHISTOCERCA AMERICANA AMERICANA (Drury). This, ubiquitous, migratory, bird-grasshopper has been collected in every month of the year in almost every habitat where tall grasses or tall weeds are found. It is the most difficult acridian to net of any taken in our area. Often only two or three are flushed on an all-day excursion and it falls into the infrequent class. Peak numbers have been recorded for X-XII. In the bend of the Trinity river, east of Hutchens, Dallas County, swaming numbers were noted X, 28, '33. These were among tall partridge peas (*Chamaecrista*).

S. LINEATA Sc. A tall-grass open sand woods *Schistocerca*, VI-X. Collected only in Johnson and Tarrant Counties.

S. OBSCURA (Fab.). A late summer and fall species with a protracted juvenile period. Taken occasionally among coarse weeds, growing in alluvial deposits along sloughs, timber margins, and fence rows; VII-XI; Ellis, Dallas, Palo Pinto, Parker and Tarrant Counties.

S. ALUTACEA (Harris). Elkhart, Anderson County, IX, 1, '33, 1 ♂ in open piney woods, two others seen.

HYPOCHLORA ALBA (Dodge). An occasional species usually taken on hoary sage, *Artemisia*. All of my records are for July; Ellis, Dallas, Johnson and Parker Counties.

PARAIDEMONA PUNCTATA (Stal.). Often swarming in upland, calcareous, waste fields and old pastures, V-VIII; Ellis, Dallas, Denton, Hill, Johnson, Parker, Tarrant and Wise Counties.

CAMPYLACANTHA OLIVACEA OLIVACEA Sc. A generally distributed, frequent, fall species of weedy pastures and waste fields; VIII-XII, Ellis, Anderson, Dallas, Denton (Dr. Harris), Johnson, Palo Pinto, Parker and Tarrant Counties.

HESPEROTETTIX VIRIDIS VIRIDIS (Thos.). An active, com-

mon to abundant, upland prairie and waste field grasshopper, VI-VIII; Ellis, Dallas, Denton, Hill, Johnson, Palo Pinto, Parker, Tarrant and Wise Counties.

H. VIRIDIS PRATENSIS (Sc.). This subspecies has been taken only at four stations. In a small rough prairie tract at Bell Branch, Ellis County, all three species of our northeastern Texas *Hesperotettix* were present in good numbers. At this place it appeared as if hybridization was in progress; VI-VII; Ellis and Dallas Counties.

H. SPECIOSA (Sc.). Often associated with *H. viridis* but more likely to be found abundantly in weedy pastures, VI-X; Ellis, Dallas, Denton, Hill, Freestone, Johnson, Palo Pinto, Parker, Tarrant and Wise Counties.

MELANOPLUS SCUDDERI TEXENSIS Hart. A generally distributed, late fall, short-winged grasshopper, VIII-XII; Comanche and Walker Counties.

M. SCUDDERI LATUS Morse. A related race appearing generally as the above; Harrison, Van Zandt, Tarrant and Ellis Counties.

M. TEXANUS (Sc.). An abundant, limestone-prairie, spring and early summer, short-winged *Melanoplus*. Ellis, Dallas, Denton, Hill, Johnson, Tarrant and Wise Counties.

M. PLEBEJUS (Stal.). Our records show *plebejus* as an occasional VIII-XII, grasshopper; Ellis, Dallas and Tarrant Counties.

M. DISCOLOR (Sc.). Fairly common limestone prairie species, sometimes definitely associated with blue sage, *Salva farinaceae* Benth. Common during June but taken as late as December; Ellis, Dallas, Denton (Dr. Harris), Johnson and Tarrant Counties.

M. FLABELLATUS Sc. Common June-July, upland prairie and open woods, short-winged *Melanoplus*. Ellis, Dallas, Hill, Johnson and Tarrant Counties.

M. GLAUCIPES (Sc.). Infrequent to occasional in sandy post oak open woods of the east cross timbers also taken in west cross timbers; VI-VIII, Dallas, Johnson and Palo Pinto Counties.

MELANOPLUS ANGULARIS Little. A single male. Collected by Jean Wilson in June, '32, at Ben Wheeler, Van Zandt County.

M. DIFFERENTIALIS (Thos.). This yellow grasshopper is often swarming in weedy field margins, along drainage ditches, among the coarse weeds in bottom fields, and in weedy pastures. It is interesting to notice that it is often absent in over-

flow areas, although abundant on adjacent shelves above overflow; VI-XI; Ellis, Dallas, Henderson, Palo Pinto, Parker, Navarro, Smith, Tarrant and Van Zandt Counties.

M. BIVITTATUS Say. This common northern "two-liner" falls into the rare class, as my records show only five individuals taken at as many different stations in low lying weedy alluvial tracts during July; Ellis and Dallas Counties.

M. PONDEROSUS PONDEROSUS Sc. Common at a few upland weedy pasture stations; VI-VII, infrequent VIII-XII; Ellis, Dallas, Johnson, Palo Pinto, Parker and Tarrant Counties.

M. CONFUSUS Sc. On account of its early spring maturity this species gets a more thorough checking than mid-summer forms. 258 specimens have been checked and *M. confusus* is fairly common at all blackland prairie and open woods cross timber stations, from late April through May, but becomes infrequent in June; Ellis, Dallas, Denton, Johnson, Tarrant and Wise Counties.

M. FEMUR-RUBRUM (DeGeer). I have only two records of this widely distributed, economically important grasshopper; Elkhart, Anderson County, IX, 1, '33, 1 ♂, 1 ♀; Palmer, Ellis County, VI, 23, '34, 1 ♂.

M. LAKINUS (Sc.). Only one record, Worth Ranch, Palo Pinto County, VII, 31, '34, 1 ♂, 1 ♀.

M. MEXICANUS MEXICANUS (Sauss.). This species is ubiquitous in northern Texas. My field notes show *mexicanus* to have been taken on fifty-seven different study trips, although altogether only 203 individuals have been recorded, making an average of less than four for each trip. The peak record of any one day of study was Bell Branch, Ellis County, XI, 20, '33, 8 ♂, 6 ♀. On most trips *mexicanus* falls into the occasional and infrequent group.

M. KEELERI KEELERI (Thos.). A frequent late fall species showing preference for open alluvial woods but also occasionally taken in open post oak woods and weedy pastures; Ellis, Anderson, Dallas, Denton (Dr. Harris) and Johnson Counties.

M. PACKARDII Sc. This wide-spread western and northern species is represented by only 5 ♂, 2 ♀, from four localities, three in Ellis and one in Palo Pinto County.

M. FOEDUS FLUVIATILIS Bruner. Only three records: low lying weedy field western Parker County, VII, 31, '34, 4 ♂, 1 ♀; Brazon river margin, Worth Ranch, Palo Pinto County, VIII, 1, '34, 5 ♂; Brazos river margin Hill County, XI, 30, '33, 2 ♂.

M. FLAVIDUS ELONGATUS Sc. Two records: western Parker

County, associated with *M. focdus fluviatilis* VII, 31, '34, 1 ♂, 1 ♀ ; Elkhart, Anderson County, IX, 1, '33, 1 ♂.

M. IMPIGER Sc. This is the most characteristic and abundant long winged *Melanoplus* of sandy waste fields and old pastures, VI-XI; Ellis, Dallas, Hill, Freestone, Johnson, Palo Pinto, Parker, Smith and Van Zandt Counties.

M. BISPINOSUS Sc. More generally distributed but not as frequent as *impiger* in *impiger* habitats; VI-XII; Ellis, Dallas, Denton, Hill, Johnson, Parker and Tarrant Counties.

PHOETALIOTES NEBRASCENSIS (Thos.). This northern and western species is represented by a single macropterous specimen, Bell Branch, Ellis County, XI, 11, '31.

PAROXYA ATLANTICA ATLANTICA Sc. This marsh acridian was taken only in the more humid east timbers at Edom, Van Zandt County and at Tyler, Smith County, VIII 1-2, '33, 6 ♂, 2 ♀.

DACTYLOTUM PICTUM (Thos.) Common locally in weedy upland pastures during June, infrequent VII-VIII, Ellis, Dallas, Hill, Johnson and Parker Counties.

Trisopsis in the United States (Dipt., Itonididae or Cecidomyiidae).

By E. P. FELT, Bartlett Tree Research Laboratories, Stamford, Connecticut

The rearing in Louisiana of a species, described below, belonging to this genus discloses the occurrence of a unique form in an area widely separated from any previously known habitat. Four described species have been recorded, namely *T. oleae* Kieff., from Wellington, South Africa, and reared from the fruit of *Olea verrucosa*, *T. alluaudi* Kieff., a female taken in a forest at an altitude of 2400 meters in Kenya, *T. hyperici* Tav., characterized as a commensal of *Geocrypta hypericina* Tav., and *T. bifida* Brethes from Buenos Aires, South America. This latest find suggests a sparse world-wide distribution of the genus in the warmer tropical or subtropical portions of the earth.

The genus *Trisopsis* is easily recognized by the three compound eye masses, due to lateral divisions of the usually large, continuous compound eye of the gall midge, and the reduced

palpal segments, there being three or possibly two, and the simple claws. A related genus, *Triommata* Barnes, (Bull. Ent. Res., Pt. 2, 22: 205-207, 1931) likewise with divided eyes, but with four, instead of three or fewer, palpal segments, with the claws of the anterior legs toothed and the lobe of the basal clasp segment spinose, has been erected for a species *coccotroctes* Barnes, recorded as predaceous on mealybug from Njala, Sierra Leone, Africa.

Trisopsis hibisci n. sp.

♂. Length .6 mm. Compound eyes three, the median somewhat narrow, on the apex of the head, arcuate, the lateral ones, just above the base of the mouth parts, broadly oval.

Antennae one-half longer than the body, rather thickly haired, pale yellowish; 14 segments, the first transverse, broadly cup-shaped, the second globose, the third and fourth fused, the fifth with stems each about one-half greater than its diameter, the basal enlargement subglobose, with a sparse sub-basal whorl of long, stout setae and a subapical circumfilum, the loops extending a little beyond the enlargement. The distal enlargement globose, with a length a little greater than its diameter, a sparse, subapical whorl of long, stout setae and sub-basal circumfilum, the loops not extending to the tip of the enlargement and a subapical circumfilum, the loops extending nearly to the base of the next segment. Terminal segment, basal enlargement roundly transverse, the stem slender, with a length four times its diameter, the distal enlargement broadly oval, with a length more than twice its diameter.

Palpi short, triarticulate, the first segment subquadrate, the second nearly twice the length of the first, the third longer, slender. Mesonotum light yellowish brown. Scutellum and post-scutellum pale yellowish. Abdomen fuscous yellowish.

Wings hyaline, slender basally, subcosta uniting with the anterior margin just before the basal half, the third vein a little before the apex, costa being interrupted, the fifth vein joining the posterior margin at the distal half, with a rudimentary anterior branch extending to approximately the distal fourth. Halteres pale yellowish. Legs pale straw, claws simple, moderately curved, pulvilli shorter than the claws. Genitalia, basal clasp segment moderately stout, slightly curved, terminal clasp segment slender, curved, dorsal plate broad, roundly emarginate, the lobes broadly rounded, ventral plate broad, broadly rounded, style long, slender.

♀. Length .75 mm., moderately stout. Antennae about three-

fourths the length of the body, sparsely haired, pale yellowish; 14 segments, the fifth with a cylindrical basal enlargement about two and one-half times its diameter and a moderately stout stem of nearly equal length. Palpi, first segment transverse, the second subquadrate, with a length one-half greater than its width and almost fused with a rudimentary third segment. Ovipositor short, the terminal lobes narrowly oval. Otherwise about as in the male.

This species was reared from the seed pods of *Hibiscus militaris* at Tallulah, LOUISIANA, in August, 1933, by Dr. R. W. Harned and submitted for study by Dr. Harold Morrison, in charge of the Division of Insect Identification, U. S. Bureau of Entomology and Plant Quarantine. *Type:* the male described above, United States National Museum, Washington, D. C.

Notes on the Taxonomic Status of Certain Species of the Genus Chlorops (Diptera, Chloropidae).*

By CURTIS W. SABROSKY,** Kansas State College.

An examination of the cotypes of *Chlorops ingrata* Williston [at present placed as a synonym of *Pseudogaurax anchora* (Loew)] has revealed its true status as a valid species, and has suggested a brief review of the case, with notes on the types.

The bulletin of the Ohio Agricultural Experiment Station for 1893 (11) contained the description of a new species, *Chlorops ingrata*, by S. W. Williston, based on "two specimens, Ohio, Prof. F. M. Webster." In the same bulletin were two short articles by Webster (9, 10), giving the rearing records of various insects and noting that *ingrata* had been bred from supposedly aborted galls on the grass, *Muhlenbergia mexicana* Trin., each gall containing a single puparium in a vertical position. Four years earlier, Webster (8) had summarized the records of insects affecting the upper portions of the culms and causing a dead and withered top. Among these were several undetermined species of *Chlorops*. One larva, in particular,

* Contribution from the Department of Entomology.
** The author's thanks are due to Dr. R. H. Beamer of the University of Kansas for many courtesies in connection with the study of types and material in the Snow Entomological Collection.

"was observed burrowing in the terminal internode of a species of grass belonging to the genus *Muhlenbergia*, possibly *M. mexicana* Trin.", and it is quite probable that this was the species later described as *C. ingrata*. Coquillett (6, p. 71) in 1898 gave more definite data, as follows: "On Aug. 12, 1884, several plants of *Muhlenbergia mexicana* were received from F. M. Webster, Oxford, Ind. At the tips of the plants were gall-like swellings, each containing a larva or puparium of this insect. The adult flies issued May 12, 15, 21 and June 1 of the following year."

Adams (1) included this species in his 1903 key to the genus *Chlorops*, and Aldrich (3, p. 633) listed it under that genus in his catalogue. In Theodor Becker's 1912 monograph of the Nearctic Chloropidae (4), however, we find it listed in a different subfamily, as a synonym of *Gaurax anchora* Loew, now known as *Pseudogaurax anchora*. The synonymy is given on the authority of Coquillett and apparently accepted by Becker.

The two cotypes (neither was designated as the type) are in the Snow Entomological Collection at the University of Kansas, and both agree in every detail with Williston's description. Both bear a small label, "Ohio," in addition to the type label. The fact noted by Williston that in the male, the triangle is "nearly contiguous above with the eyes," is probably due solely to the condition of the specimen, which was apparently slightly teneral, and shriveled somewhat in drying. Probably as a further result of this, the front of the male projects anteriorly to a distance subequal to the length of the eye (in dorsal aspect), whereas in the female and in compared specimens the projection is not as great. In the female type there is also a wider space between the triangle and the eyes at the vertex.

Upon comparison of Williston's description with a description or specimens of *Pseudogaurax anchora*, it is difficult to believe that they could be confused. In addition to the differences evident in the descriptions, there is a very distinct contrast in the biology as thus far recorded, the *Chlorops* being a gall-former on grass, and the *Gaurax* a scavenger in the egg-sacs of spiders, cocoons of various moths, etc.

The exact generic position of the species is difficult to determine. Adams (1) has it in his key to the species of *Chlorops*, but the types will not run to *ingrata* in that key by any stretch of the imagination. Instead, they run to a group of three species—*cucera* Lw., *sanguinolenta* Lw., and *maculosa* Lw.—which then comprised the subgenus *Anthracophaga*. In Becker's key to *Chlorops* (4), the types run to a section including *palpalis* Adams, *crocota* Lw. var., and *abdominalis* Coq., but they agree with none of these species. In most respects, *ingrata* belongs in *Anthracophaga*, having the projecting front, receding face, large triangle, slightly produced third antennal joint, black palpi, thick brown wing-veins, dull color, and broad, stocky appearance usually associated with that genus. Becker apparently redescribed it under the name of *Anthracophaga interrupta*. It is proposed to place the species as *Anthracophaga ingrata* (Will.), with *interrupta* as its synonym.

ANTHRACOPHAGA INGRATA (Will.). New combination.

Chlorops ingrata Williston.

Anthracophaga interrupta Becker 1912, new synonym.

Redescription from the types.

♂ ♀. Large, broadly-built species, dull, yellow and black, with anteriorly extended head, black palpi, deep median sulcus on triangle, and heavy dark brown wing-veins. Length, 3-3½ mm.

Head very broad, dull yellow, the eyes small, front over one-half the head width in the female, less in the male due to shrinkage, projecting considerably beyond the eyes. Triangle very large, shining, three-fourths the width of front at base, apex reaching acutely to the anterior margin of the extended front, strongly punctate on the sides, each puncture bearing a minute hair, a deep median sulcus extending from the median ocellus to the apex. The posterior margins of the triangle, the ocellar spot, and a stripe down the median sulcus black in both specimens; rest of triangle dark cream-colored in the male ["shining luteous"—Williston], darkened to brown in the female. A black, divergent outer vertical bristle near corner of each eye, a smaller, convergent inner vertical at the hind corners of the triangle. Occiput yellow with two black vittae, as continuations from the triangle. In lateral aspect, the front moderately projecting, face strongly receding, eyes diagonally placed,

cheeks broad, equal to diameter of third antennal joint and over one-third the eye-height. Face, cheeks, mouth cavity and proboscis yellow, the cheek margins, lateral and median facial ridges, clypeus and palpi black. Third antennal joint slightly longer than broad, subreniform, orange with black apex. Arista dusky yellowish, brown at base, scarcely thickened.

Mesonotum dull clay-yellow, the three stripes, supra-alar vittulae, and a small spot on each humerus, moderately dull black. Median stripe about three-fourths the length of notum, the other vittae and the vittulae extending to the post-alar callus. One notopleural and one postalar bristle. Scutellum large, subtriangular with rounded apex, a pair of large apical and one pair of smaller subapical bristles, yellow ventrally, the sides of the disk light brown and beset with short black hairs, the center of the disk occupied by a pale yellow, glabrous, flattened and depressed triangular area. Metanotum black. Pleura dull yellow, with five blackish-brown spots, below the anterior spiracle, on the antero-ventral angles of mesopleura and pteropleura, large sternopleural spot, and a small one on hypopleura.

Abdomen: segments with broad, brown to blackish bands on the posterior margins, a median extension of pigment joining each band to the preceding. Base and venter yellow.

Legs: fore coxae dark brown and yellow-marked, femora black or dark brown, the tips yellowish, tibiae yellowish, the middle of hind tibiae and all tarsi brown. No "sensory area" on hind tibiae.

Wings cinereous hyaline, with dark brown veins. Costa slightly exceeds tip of third vein, second costal segment one and one-half times as long as the third, costal fracture weak. First vein thickened. Third and fourth veins widely divergent. Hind cross-vein twice as long as small cross-vein, and about one and one-quarter times its length from the small. Halteres with yellow pedicel and white knob.

Cotypes; two specimens, OHIO (F. M. Webster). Reared from galls on *Muhlenbergia mexicana.* In Snow Entomological Collection, University of Kansas.

Additional records: INDIANA: several specimens reared from galls on *Muhlenbergia mexicana* Trin., received from F. M. Webster, Oxford, Ind. (Coquillett, 1898). KANSAS: eight specimens, emerged March 28, 29, and 31, 1934, from galls at the tip of culms of *Muhlenbergia racemosa* (Michx.)*, collected in Pottawatomie County, near Westmoreland (D. A. Wilbur); one, Marion County, Mar. 28, 1934, reared from

Muhlenbergia sp. (D. A. Wilbur); one, Jackson County, Mar. 26, 1934, reared from *Muhlenbergia* sp., probably *schreberi* Gmel. (D. A. Wilbur).

Two other specimens were also found in the C. F. Adams Collection of Chloropidae at the University of Arkansas, bearing a handwritten label, "*Chlorops ingrata*," but no locality label. These specimens and four from Pottawatomie County, Kansas, were compared in detail with the types and found to be identical. Considerable variation was noted in the extent of puncturing on the triangle, color on the third antennal joint and scutellum, and intensity of color of the triangle.

The two males from Jackson and Marion Counties, Kansas, were also compared with the types, and found to be similar except for entirely black antennae and smaller size. These differences are of doubtful significance, and the specimens are therefore placed as *ingrata*. Further, they fit the description of *Anthracophaga interrupta* Becker (1912) exactly, and I believe that this species is a synonym of *ingrata* Williston.

Ingrata is very close to *Chlorops fossae* Becker (4), which has the deep median sulcus in the triangle, but which differs principally in having small, entirely black antennae, broad cheeks, and black legs. The other parts of the descriptions are so similar that these two species may be found to be synonymous when more material is available. Perhaps *fossae* should also be transferred to *Anthracophaga*.

Chlorops adamsi nom. nov.

Chlorops annulata Adams nec Walker.

Francis Walker in 1849 (7) described a new species from Canada, which he called *Chlorops annulata*. Loew believed it to be a *Chloropisca*, but Becker thought it more likely a *Diplotoxa* or *Anthracophaga*. Years later, Adams (2) described a species from Louisiana to which he gave the same name, but Becker, although recognizing that it was preoccupied, continued

* Grasses identified by Dr. F. C. Gates, of the Dept. of Botany, Kansas State College.

to use *annulata* Adams on the ground that Walker's species undoubtedly was not a *Chlorops*. Prior use of the name in the genus, however, makes *annulata* Adams a homonym, and a new name is proposed to straighten out the difficulty.

CHLOROPS CINERAPENNIS Adams (1903, p. 40).

Chlorops albifascies Adams (1903, p. 42). New synonym.

The original spelling of each name is retained here, although Aldrich (3) emended the former to *albifacies*, and both Aldrich and Becker (4) used *cinereipennis* for the latter.

The types of both species are in the Snow Entomological Collection at the University of Kansas, and were recently studied and compared. The two descriptions are almost identical, except that *albifascies* is said to have a "shallow longitudinal sulcus" on the triangle, and black third antennal joint, whereas for *cinerapennis* no mention is made of a sulcus, and the antennal joint is black with yellow base. Using the latter character as a primary basis for separation, Becker locates the two in different sections of his key, and Adams himself separated them on this point. Strangely enough, however, in view of the close proximity of the two in Adams' publication, the types were found to be identical. *Cinerapennis* also has the sulcus, though it was not mentioned by Adams. Furthermore, it was found that the "wholly black" third antennal joint of *albifascies* was really reddish on the basal fourth. In all other particulars, also, the two type series were found to coincide, and *albifascies* therefore becomes an absolute synonym of *cinerapennis*, which has page priority. This species is very close to *sulphurea* Lw., and may eventually prove to be merely a variety of that species.

Incidentally, the figure labeled *Chlorops albifascies* in Becker's monograph (1912, pl. 1, fig. 3) is not *albifascies*, but some other species.

CHLOROPISCA GLABRA (Meig.).

Chlorops halteralis Adams.

Becker (4) noted that the description of *halteralis* Adams was very close to that of *Chloropisca glabra*, and he placed it as a probable synonym of Meigen's species, which is a very com-

mon fly in North America. The type of *halteralis* has been examined at the University of Kansas, and Becker's synonymy is verified. The specimen is smaller than the usual specimens of *glabra*, but otherwise is identical.

CHLOROPS LITURATA Adams (1903).

Chlorops stigmaticalis Becker (1912) new synonym.

Becker's species was described as *quadrimaculata* in his monograph, but the name was found to be preoccupied and was later changed to *stigmaticalis* (5). A specimen determined by Aldrich as this species was compared with the cotypic series of *liturata* in the Snow Collection at the University of Kansas, and found to be the same. Likewise, a number of specimens from Lander, Wyoming, were compared with the cotypes of *liturata* (type locality: Lusk, Wyo.) and found to be identical. Comparison of the descriptions showed their similarity, the essential difference being the presence of fine lateral furrows on the triangle of *stigmaticalis*. The types of *liturata* Adams also show this peculiarity, although it passed unmentioned in Adams' description. *Stigmaticalis* is therefore placed as a synonym of the earlier species.

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Dictionary of Entomological terms: In preparation.

Authors invite correspondence relative thereto and request new words as well as references to articles citing terms or dealing in any way with nomenclature.

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Entomological Literature

COMPILED BY LAURA S. MACKEY UNDER THE SUPERVISION OF E. T. CRESSON, JR.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The figures within brackets [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within ( )** follows; **then the pagination follows the colon :**

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

New Titles of Periodicals and Serials Referred to.

112. Anales del Instituto de Biologia Mexico.

GENERAL.—Aldrich, J. M.—Obituary and bibliography. By A. L. Melander. [5] 41: 133-149, ill. **Dunn, L. H.**—Entomological investigations in the Chiriqui Region

of Panama. [5] 41: 166-183. **Harmer, S. E.**—Publication of nomina nuda. [31] 134: 973. **Heikertinger, F.**—Wie ist ein manuskript auszustatten? [79] 20: 231-243. **Horn, W.**—"Aus der entomologischen welt." [110] 1: 304-308. **Hudson, G. V.**—A stable nomenclature? [8] 71: 16-17. **Jones, F. M.**—Further experiments on coloration and relative acceptability of insects to birds. [36] 82: 443-453, ill. Bird-feeding experiments in 1934, on Martha's Vineyard Island, Massachusetts: the return of the "17-year Cicada" to the island: notes on two of its butterflies. [Pro. R. Ent. Soc. London] 9: 80-82. **Jones, F. M. et al.**—Dr. McAtee and "Relative Acceptability." [Pro. R. Ent. Soc. Lond.] 9: 21-39. **Morse, A. P.**—The insect collections of a public museum. [5] 41: 158-163. **Silvestri, F.**—Compendio di Entomologia applicata 1934. 448 pp., ill.

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tion de la soidisant "reduction vitale" de sels d'argent par certains organes d'arthropodes. [An. Soc. Sc. Bruxelles) 54: 346-361, ill. **Madwar, S.**—Biology and morphology of the immature stages of Mycetophila marginata and Dynatosoma fuscicorne. [75] 15: 108-116, ill. **Marshall & Staley.**—Exhibition of "autogenous" characteristics by a British strain of Culex pipiens. [31] 135: 34. **Molitor, A.**—Neue beobachtungen und versuche mit grabwespen. [97] 54: 450-466. **Negi, P. S.**—The alimentary canal, its appendages, salivary glands and the nervous system of the adult female lac insect, Laccifer lacca (Coccidae) [22] 25: 541-546, ill. **Oehlenschlaeger, E. A.**—Papilio g. glaucus mutilated and abandoned at Milwaukee, U. S. A.: the hindwing 'tails" as parasemes adapted to protect the vital parts. [Pro. R. Ent. Soc. Lond.] 9: 57-58. **Poulton, E. B.**—Incipient mimicry by a Californian form of the nymphaline butterfly Basilarchia weidemeyerii, of the B. lorquini, and Adelpha californica association. Mimetic resemblance of a fly (Baccha) to a fossorial wasp (Trypoxylon) on Barra Colorado Island. [Pro. R. Ent. Soc. Lond.] 9: 53-56; 56-57. **Rau, P.**—Behavior notes on certain solitary wasps [4] 66: 259-261, ill. **Reed, S. C.**—Possible polyploidy in the Hymenoptera. [5] 41: 164-165. **Stanley, J.**—A mathematical theory of the growth of populations of the flour beetle, Tribolium confusum. [Can. Jour. Res.] 11: 728-732. **Stiles, K. A.**—Normal butyl alcohol technic for animal tissues with special reference to insects. [Stain Tech.] 9: 97-100. **Thomas, M.**—L'Immobilisation protectrice. Observations sur Carausius morosus. [33] 74: 351-360. **Varde, V. P.**—The protrusible vesicles in Cyrtacanthacrinae-Acridiinae. (Orth.). [Jour. Univ. Bombay] 2: 53-57, ill. **Wolcott, G. N.**—The diapause portion of the larval period of Diaprepes abbreviatus. [Jour. Agric. Univ. Puerto Rico] 18: 417-428, ill.

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Special Note.—A biography of Charles Valentine Riley, eminent chief of the Division of Entomology, U. S. Department of Agriculture (1878-79, 1881-1894), by his successor, Dr. L. O. Howard, occupies a little more than one page (609-610) of Volume XV (Platt-Roberdeau) of the Dictionary of American Biography, which appeared January 25th, 1935. Published under the auspices of the American Council of Learned Societies, this distinguished biographical work is fast approaching the proportions of the one definitive source of information on the lives of America's great.

THE COMPLETE BOOK OF BRITISH BUTTERFLIES. By F. W. FROHAWK, with foreword by Lord ROTHSCHILD. Ward, Lock & Co. Ltd., London and Melbourne, December, 1934. 384 pages, 32 colour plates and over 160 unique sketches from life. 10 shillings, 6 pence, net.—This is a well printed and illustrated book, the colored plates giving excellent figures of all of the 68 British butterflies, their eggs, larvae and pupae, details of the seventh segment of the larvae, and a number of aberrations of the imagoes. There are introductory chapters on classification, a check list giving the new generic nomenclature prepared by the Committee on General Nomenclature of the Royal Entomological Society, on aberration and protective resemblance, migration, hints on collecting and rearing butterflies, and a list of the food plants of the species.

The numerous text figures were made by the author, and are excellently reproduced, showing many phases of the habits and life histories of these insects, as well as many aberrations not previously figured.

The book while intended for popular consumption, is scientifically accurate, and contains so much interesting information

about the butterflies concerned that it will be a valuable as well as a beautiful addition to the library of any lepidopterist.—R. C. WILLIAMS, JR.

THE GENERIC NAMES OF THE HOLARCTIC BUTTERFLIES. Vol. I—1758-1863. By FRANCIS HEMMING. London, July, 1934. Printed by order of the Trustees of the British Museum and sold by the British Museum (Natural History), Cromwell Road, S. W. 7, and by Bernard Quaritch. (Price not mentioned.) 180 pages.—This work has a preface by Capt. N. D. Riley, and is in two parts, the first, introductory, being an account of the preparation of the work, the author's procedure, a discussion of the rules and some exceptions desired, and remarks on some of the books consulted. The second part is a synonymic catalogue of the 500 names proposed, the type fixation and the author's remarks and conclusions. This is followed by an appendix, being extracts from the code on the law of priority, and an alphabetical index.

Mr. Hemming began his research in 1931. It covers the period from the 10th edition of Linné, 1758, to the beginning of the Zoological Record, 1868, and the Holarctic butterflies only except where later references are necessary, or where extra-faunal insects have been credited to the region treated of. Mr. Hemming is to be congratulated on his industry which is well understood by the writer, who, with his friend, Mr. Ernest L. Bell, has spent years in assembling a card catalog of the neotropical Hesperidae alone. The suggestions for the suspension of the rules refer to the following genera of long use in literature; *Euploea* Fab., *Argynnis* Fab., *Vanessa* Fab., *Euthalia* Hüb., *Nymphidium* Fab., *Strymon* Hüb. and *Colias* Fab. Many prominent American entomologists have signed a petition to the International Commission requesting the suspension of the rules in these cases. The writer would have wished that more of the older, generally used names had been included in this list, but, in the interests of stability, will accept all of Mr. Hemming's findings, hoping that writers on the Rhopalocera will have this work before them, and follow it in future in their use of generic names. It is to be hoped that the author will continue the work, not only bringing it up to date, but also include the World genera, and it would appear he is so doing from the notes he is publishing from time to time in *Stylops* and *The Entomologist*. His work is of great value towards the goal, I hope attainable, of a stable scientific nomenclature.—R. C. WILLIAMS, JR.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

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